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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/533,705	03/23/2000	Matthew Douglas Penry	NSC1-G3900	1251

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EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/533,705

Applicant(s)

PENRY ET AL.

Examiner

Thoi V Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-28 ~~is~~/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-28 ~~is~~/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the Amendment filed July 26, 2004.

Accordingly, claims 1-23 were cancelled, and new claims 24-28 were added.

Currently, claims 24-28 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 24-28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Janssen et al. (Pub. No. US 2001/0003474 A1) in view of Lu et al. (USPN 5,764,324).

Re claim 24, as shown in Figs. 1 and 2, Janssen discloses a silicon-backed microdisplay comprising:

a silicon die 10;

a silicon-side conductive layer 12 disposed directly on the silicon die 10;

a silicon-side passivation layer 24 of 2000-6000 anstroms disposed directly on the silicon-side conductive layer 12 (page 3, paragraph 32);

a cover glass sheet 22;

a glass-side conductive layer 20 formed of ITO and disposed directly on the cover glass (page 2, paragraph 27);

a glass-side passivation layer 26 of a predetermined material and thickness disposed directly on the glass-side conductive layer (page 2, paragraphs 30 and 31);
and

liquid crystal material 16 sandwiched directly between the glass-side passivation layer and the silicon-side passivation layer,

wherein the glass-side passivation layer 26 includes SiO₂, or Al₂O₃, or an oxide or nitride of titanium or tantalum, or any other insulating material (page 2, paragraph 30);
and

wherein, *re claim 25*, the silicon-side conductive layer 12 comprises aluminum (page 2, paragraph 26).

However, Janssen et al. does not disclose the work function balance of said silicon-backed microdisplay structure and a silicon-side passivation layer comprising a silicon dioxide layer in combination with a silicon nitride layer.

As well-known in the art, the work function balance between the ITO glass-side conductive layer 20 and the Al silicon-side conductive layer 12 is different by more than 0.29 eV as disclosed by Lu et al. (col. 2, lines 40-42).

Re claim 26, as shown in Fig. 6, Lu et al. also discloses a silicon-side passivation layer 54 and an ITO layer 56 formed on the conductive layer 32. Lu et al. teaches that the silicon-side passivation layer 54 is preferably a silicon dioxide film and the ITO layer

Art Unit: 2871

may be replaced with an insulating layer such as silicon nitride layer (col. 6, lines 16-37).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the silicon-backed microdisplay structure of Janssen et al. with the teaching of Lu et al. by forming a silicon-side passivation layer comprises a silicon dioxide layer in combination with a silicon nitride layer so as to further avoid flicker (col. 5, line 65 through col. 6, line 3).

5. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable Janssen et al. (Pub. No. US 2001/0003474 A1) over in view of Lu et al. (USPN 5,764,324) as applied to claims 24-26 above and further in view of Kaneko (USPN 6,504,588 B1).

The silicon-backed microdisplay of Janssen et al. as modified in view of Lu et al. above includes all that is recited in claim 27 except for the glass-side conductive layer having a characteristic resistance in the range of 100-500 ohms/square and a light transmissivity of 90% or greater.

As shown in Figs. 1 and 9, Kaneko discloses a liquid crystal display comprising an ITO electrode 3 having a characteristic resistance of 100 ohms/square and a light transmissivity of 90% or greater (col. 7, lines 5-10).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the silicon-backed microdisplay of Janssen et al. with the teaching of Kaneko by an ITO glass-side conductive layer having a characteristic resistance of 100 ohms/square and a light transmissivity of 90% or greater to improve the brightness of the display (col. 7, lines 15-17).

Art Unit: 2871

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Janssen et al. (Pub. No. US 2001/0003474 A1) in view of Lu et al. (USPN 5,764,324) as applied to claims 24-26 above and further in view of Takamira et al. (USPN 6,143,418).

The silicon-backed microdisplay of Lu et al. as modified in view of Janssen et al. above includes all that is recited in claim 23 except for the combination of the glass-side passivation layer and the glass side conductive layer having an overall transmissivity of 90% or greater and a reflectivity of 1%.

As shown in Fig. 1, Takamira et al. discloses a transparent conductive film 10 comprising a transparent conductive film 1 and a transparent thin film (or passivation layer). In Table 2 and Table 3, Takamira et al. discloses that this transparent conductive film in "Comparative Example 2" has a high light transmissivity of about 102.7% and a low reflectivity of about 1% (col. 17, lines 55-65 and col. 18, lines 1-15).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the silicon-backed microdisplay of Janssen et al. with the teaching of Takamira et al. by employing a transparent conductive film having an overall transmissivity of 90% or more and a reflectivity of about 1% so as to control the tone of the transmitted images and to obtain an advantage over the static prevention and electromagnetic shielding of the display (col. 18, lines 59-65).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

Art Unit: 2871

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong



10/17/2004



TARIFUR R. CHOWDHURY
PRIMARY EXAMINER